them completely is impractical. The NCDR CathPCI Registry reperfusion measures allow for exclusions for patient-centered reasons for delay (e.g., the need for a decision-altering diagnostic test prior to possible primary percutaneous coronary intervention). Although the measures may include examples, they do not include specific lists of these reasons. Such exclusions were integrated into the measure to acknowledge the fact that high-quality clinicians providing the best care will, on occasion, face situations where their delivery of reperfusion therapy is delayed for clinically appropriate reasons. As Ellis and colleagues point out, the flexibility intrinsic to this exclusion may create opportunities for gaming.

Although we believe that the high standards of medical professionals protect the integrity of the measures to some extent, we are not so naive to assume that professional integrity alone will eliminate gaming. Unfortunately, however, addressing this issue by removing the exclusion as proposed by Ellis and colleagues raises substantial problems of its own by undermining the clinical face validity of the measure. The absence of such exclusions creates other compelling arguments—namely, that centers that care for particularly complex patients, where clinically reasonable delays are more common—are disproportionately penalized. Indeed, before the Department of Health and Human Services' Centers for Medicare and Medicaid Services/Joint Commission measure incorporated this exclusion, such complaints were among the most common causes for objection to the reperfusion measures (Jo DeBuhr, Colorado Foundation for Medical Care, personal communication, July 2010).

This dilemma, among the many complex issues surrounding measuring reperfusion quality, was addressed explicitly by an ACC/AHA Writing Group comprised of experienced clinicians and experts in performance measurement (2). This writing group concluded that this exclusion is important, despite its limitations. This opinion is reflected in the current ACC/AHA performance measures for acute myocardial infarction (3).

Further, the Writing Group recommended: 1) surveillance for the proportion of cases where exclusions are noted, including the distribution of the exclusions by institution; and 2) audit of the clinical appropriateness of exclusions both in a targeted manner (i.e., among institutions with the highest numbers of excluded cases) as well as randomly.

To this point, NCDR metrics have been used predominantly for quality improvement. Although some of the metrics reported to registry participants are not intended for accountability purposes, others—including the time-to–primary percutaneous coronary intervention metric in question—might reasonably be viewed as useful in this regard. As this occurs, we agree with Ellis and colleagues that greater scrutiny of exclusions, consistent with the recommendations by the ACC/AHA Writing Group is warranted.

***Frederick A. Masoudi, MD, MSPH**
John C. Messenger, MD
W. Douglas Weaver, MD
Ralph G. Brindis, MD, MPH

*Denver Health Medical Center and University of Colorado
Division of Cardiology, MC0960
Denver Health Medical Center
777 Bannock Street
Denver, Colorado 80204
E-mail: fred.masoudi@ucdenver.edu

doi:10.1016/j.jacc.2010.08.611

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Serial Intravascular Ultrasound Examinations and Clinical Outcome

We read with interest the paper by Nicholls et al. (1) investigating the relationship between intravascular ultrasound (IVUS)–derived measures of atherosclerosis (baseline and change in percent atheroma volume) and cardiovascular outcomes (death, myocardial infarction, and coronary revascularization). Based on the study design, however, it seems difficult to determine the relationship between change in percent atheroma volume and death or myocardial infarction because IVUS examination at follow-up is often missing in patients with such clinical events. To clarify this point, it would be of great help if the investigators would provide data regarding how many patients died or had myocardial infarction and how long patients underwent follow-up for occurrence of cardiovascular outcomes after follow-up IVUS examination.

In addition, Figure 1 of their paper (1) shows a striking increase in cardiovascular events between 500 and 600 days (repeat IVUS examination period), suggesting angiographically/IVUS-driven revascularization (2). Therefore, it remains unclear whether IVUS-derived measures of atherosclerosis are associated with clinical outcomes without routine angiographic/IVUS follow-up.

***Hideaki Kaneda, MD, PhD**
Junya Ako, MD, PhD
Mitsuyasu Terashima, MD, PhD

*Tokyo Heart Center
5-4-12 Kita-shinagawa
Shinagawa-ku,
Tokyo 141-0001
Japan
E-mail: hdkaneda@gmail.com

doi:10.1016/j.jacc.2010.06.042

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